AMENDMENT

To: Commissioner of the Patent Office

1. Identification of International Application
   PCT/JP96/01472

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4. Item to be Amended
   Claims

5. Subject Matter of Amendment
   As per the attached sheets

6. List of Attached Documents:
   New sheets for "Claims" from page 43 to page 57, and
   page 57/1; one copy for each

CLAIMS

1. (Amended) A method for producing an optical element, comprising:

a step of forming a proton exchange layer in an $LiNb_xTa_{1-x}O_3$ ($0 \leq X \leq 1$) substrate so as to form an optical waveguide; and

a low-temperature annealing step of performing a heat treatment for the substrate at a temperature of 120°C or lower for 1 hour or more.

2. (Amended) A method for producing an optical element according to claim 1, wherein the low-temperature annealing step is performed at a temperature equal to or higher than 50°C but lower than or equal to 90°C.

3. (Amended) A method for producing an optical element according to claim 1, wherein the low-temperature annealing step comprises a step of gradually lowering the temperature.

4. (Amended) A method for producing an optical element according to claim 1, wherein the step of forming the proton exchange layer so as to form an optical waveguide comprises:

a step of performing a proton exchange process for the substrate; and a high-temperature annealing step of performing a heat treatment for the substrate at a temperature of 150°C or higher.

5. (Amended) A method for producing an optical element according to claim 4, wherein the low-temperature annealing step is performed at a temperature equal to or higher than 50°C but lower than or equal to 90°C.

6. (Amended) A method for producing an optical element according to claim 4, wherein the low-temperature annealing step comprises a step of gradually lowering the temperature.

7. (Amended) A method for producing an optical element according to claim 1, wherein the step of forming the proton exchange layer so as to form an optical waveguide comprises: a step of forming a plurality of periodically-arranged domain inverted layers in the substrate; and a step of forming an optical waveguide on a surface of the substrate.

8. A method for producing an optical element, comprising:

a step of performing a proton exchange process for an $LiNb_xTa_{1-x}O_3$ ($0 \le X \le 1$) substrate; and

an annealing step of performing a plurality of heat treatments including at least first and second heat treatments for the substrate,

wherein a temperature of the second annealing is lower than a temperature of the first annealing by 200°C or more.

9. A method for producing an optical element according to claim 8, wherein the second annealing is performed at a temperature equal to or higher than 50°C but lower than or equal to 90°C.

10. An optical element, comprising an $LiNb_xTa_{1-x}O_3$ ($0 \le X \le 1$) substrate and a proton exchange layer formed in the substrate, wherein the optical element is formed of a stable proton exchange layer such that a refractive index of the proton exchange layer does not vary with time during operation.

11. An optical element according to claim 10, wherein at least a portion of the proton exchange layer forms an optical waveguide.

12. A light source comprising: a semiconductor laser; and an optical wavelength conversion element for receiving laser light emitted from the semiconductor laser so as to convert the laser light to a harmonic wave, wherein:

the optical wavelength conversion element includes: an optical waveguide for guiding the laser light; and domain inverted structures periodically arranged along the optical waveguide, the optical waveguide and the domain inverted structures being formed of a stable proton exchange layer whose refractive index does not vary with time during operation.

13. (Amended) A laser light source comprising:

a semiconductor laser for emitting a fundamental wave;

a single mode fiber for conveying the fundamental wave; and

an optical wavelength conversion element for receiving the fundamental wave emitted from the fiber so as to generate a harmonic wave, the optical wavelength conversion element having periodic domain inverted structures,

wherein the optical wavelength conversion element has a modulation function.

14. (Canceled)

15. A laser light source according to claim 13, wherein the optical wavelength conversion element is formed in an $LiNb_xTa_{1-x}O_3$ ($0 \leq X \leq 1$) substrate.

16. (Amended) A laser light source, comprising:

a semiconductor laser for emitting a pumped light;

a fiber for conveying the pumped light;

a solid state laser crystal for receiving the pumped light emitted from the fiber so as to generate a fundamental wave; and

an optical wavelength conversion element for receiving the fundamental wave so as to generate a harmonic wave, the optical wavelength conversion element having periodic domain inverted structures.

17. A laser light source according to claim 16, wherein the optical wavelength conversion element has a modulation function.

18. A laser light source according to claim 16, wherein the optical wavelength conversion element is formed in an $LiNb_xTa_{1-x}O_3$ ($0 \le X \le 1$) substrate.

19. A laser light source according to claim 16, wherein the solid state laser crystal and the optical wavelength conversion element are integrated together.

20. (Amended) A laser light source, comprising:

a semiconductor laser for emitting a pumped light;

a solid state laser crystal for receiving the pumped light so as to generate a fundamental wave;

a single mode fiber for conveying the fundamental wave; and

an optical wavelength conversion element for receiving the fundamental wave from the fiber so as to generate a harmonic wave, the optical wavelength conversion element having periodic domain inverted structures.

21. A laser light source according to claim 20, wherein the optical wavelength conversion element has a modulation function.

22. A laser light source, comprising:

a distributed feedback type semiconductor laser for emitting laser light;

a semiconductor laser amplifier for amplifying the laser light; and

an optical wavelength conversion element for receiving the amplified laser light so as to generate a harmonic wave, the optical wavelength conversion element having periodic domain inverted structures.

23. A laser light source according to claim 22, wherein the optical wavelength conversion element has a modulation function.

24. A laser light source according to claim 22, wherein the optical wavelength conversion element is formed in an $LiNb_xTa_{1-x}O_3$ ($0 \le X \le 1$) substrate.

25. A laser light source according to claim 22, wherein the semiconductor laser is wavelength-locked.

26. A laser light source, comprising:

a semiconductor laser for emitting laser light; and

an optical wavelength conversion element in which periodic domain inverted structures and an optical waveguide are formed,

wherein a width and a thickness of the optical waveguide are each 40 μm or greater.

27. A laser light source according to claim 26, wherein the optical wavelength conversion element has a modulation function.

28. A laser light source according to claim 26, wherein the optical wavelength conversion element is formed in an $LiNb_xTa_{1-x}O_3$ ($0 \le X \le 1$) substrate.

29. A laser light source according to claim 26, wherein the optical waveguide is of a graded type.

30. (Amended) A laser device, comprising:

a laser light source having a semiconductor laser for radiating laser light and an optical wavelength conversion element for generating a harmonic wave based on the laser light;

a modulator for modulating an output intensity of the harmonic wave; and

a deflector for changing a direction of the harmonic wave emitted from the laser light source,

wherein periodic domain inverted structures are formed in the optical wavelength conversion element, and

the semiconductor laser is wavelength-locked.

31. (Amended) A laser device according to claim 30, wherein the laser light source further comprises:

a single mode fiber for conveying the laser light from the semiconductor laser to the optical wavelength conversion element.

32. (Amended) A laser light source according to claim 76, wherein the laser light source further comprises a fiber for conveying the laser light from the semiconductor laser to the solid state laser crystal.

33. (Amended) A laser light source according to claim 30, wherein:

the semiconductor laser is a distributed feedback type semiconductor laser; and

the laser light source further comprises a semiconductor laser amplifier for amplifying the laser light from the distributed feedback type semiconductor laser.

34. (Amended) A laser light source according to claim 30 or 76, wherein: an optical waveguide is further formed in the optical wavelength conversion element; and

a width and a thickness of the optical waveguide are each 40 µm or greater.

35. (Amended) A laser device, comprising:

an ultraviolet laser light source comprising an optical wavelength conversion element, in which periodic domain inverted structures are formed, and being configured so as to be capable of radiating modulated ultraviolet laser light; and

a deflector for changing a direction of the ultraviolet laser light,

wherein the deflector irradiates a screen with the ultraviolet laser light so as to generate red, green or blue light from a fluorescent substance being applied on the screen.

36. (Amended) A laser device according to claim 35, wherein the laser light source further comprises:

a semiconductor laser; and

a single mode fiber for conveying laser light from the semiconductor laser to the optical wavelength conversion element, and

the optical wavelength conversion element generates harmonic wave based on the conveyed laser light.

37. (Amended) A laser light source according to claim 35, wherein the laser light source further comprises:

a semiconductor laser;

a fiber for conveying laser light from the semiconductor laser; and

a solid state laser crystal for receiving laser light emitted from the fiber so as to generate a fundamental wave, and

the optical wavelength conversion element generates a harmonic wave from the fundamental wave.

38. (Amended) A laser light source according to claim 35, wherein the laser light source further comprises:

a distributed feedback type semiconductor laser; and a semiconductor laser amplifier for amplifying laser light from the distributed feedback type semiconductor laser.

39. (Amended) A laser light source according to claim 35, wherein: the laser light source further comprises a semiconductor laser for emitting laser light;

an optical waveguide for guiding the laser light

is further formed in the optical wavelength conversion element; and

a width and a thickness of the optical waveguide are each 40 μm or greater.

40. (Amended) A laser device, comprising:

three laser light sources for generating red, green and blue laser light beams;

a modulator for changing an intensity of each of the laser light beams; and

a deflector for changing a direction of each of the laser light beams,

wherein at least one of the three laser light sources is formed of a semiconductor laser and an optical wavelength conversion element having periodic domain inverted structures, and

laser light emitted from the semiconductor laser is locked.

41. (Amended) A laser device according to claim 40, wherein the laser light source further comprises a single mode fiber for conveying the laser light from the semiconductor laser to the optical wavelength conversion element, and

the optical wavelength conversion element receives the laser light emitted from the fiber as a fundamental wave, and generates a harmonic wave based thereon.

42. (Amended) A laser light source according to claim 77, wherein the laser light source further comprises a fiber for conveying the laser light from the semiconductor laser to the solid state laser crystal.

43. (Amended) A laser light source according to claim 40, wherein the semiconductor laser is a distributed feedback type semiconductor laser, and the laser light source further comprises a semiconductor laser amplifier for amplifying laser light from the distributed feedback type semiconductor laser.

44. (Amended) A laser light source according to claim 40 or 77, wherein an optical waveguide for guiding the laser light is further formed in the optical wavelength conversion element, and

a width and a thickness of the optical waveguide are each 40 μm or greater.

45. A laser device, comprising:

at least one laser light source including a semiconductor laser;

a sub-semiconductor laser;

a modulator for changing an intensity of light from the laser light source;

a screen; and

a deflector for changing a direction of light from the laser light source so as to scan the screen with the light,

wherein light emitted from the sub-semiconductor laser scans a peripheral portion of the screen; and radiation of laser light from the laser light source is terminated when an optical path of the light emitted from the sub-semiconductor laser is blocked.

46. (Amended) A laser device according to claim 45, wherein the laser light source further comprises:

an optical wavelength conversion element for generating a harmonic wave; and

a single mode fiber for conveying laser light from the semiconductor laser to the optical wavelength conversion element.

47. (Amended) A laser light source according to claim 45, wherein the laser light source further comprises:

a fiber for conveying laser light from the semiconductor laser;

a solid state laser crystal for receiving laser light emitted from the fiber so as to generate a fundamental wave; and

an optical wavelength conversion element for generating a harmonic wave from the fundamental wave.

48. (Amended) A laser light source according to claim 45, wherein the semiconductor laser is a distributed feedback type semiconductor laser; and the laser light source further comprises a semiconductor laser amplifier for amplifying laser light from the distributed feedback type semiconductor laser.

49. (Amended) A laser light source according to claim 45, wherein the laser light source further comprises:

an optical wavelength conversion element in which an optical waveguide for guiding laser light from the semiconductor laser and periodic domain inverted structures are formed, wherein

a width and a thickness of the optical waveguide are each 40 μm or greater.

50. A laser device, comprising:

at least one laser light source including a semiconductor laser;

a deflector for changing a direction of laser light radiated from the laser light source so as to scan the screen with the laser light, wherein:

the device further comprises two or more detectors for generating a signal when receiving a portion of the laser; and

generation of laser light from the laser light source is terminated when the detector does not generate a signal for a certain period of time while the deflector scans the screen with the laser light.

51. (Amended) A laser device according to claim 50, wherein the laser light source further comprises:

an optical wavelength conversion element for generating a harmonic wave; and

a single mode fiber for conveying laser light

from the semiconductor laser to the optical wavelength conversion element.

52. (Amended) A laser light source according to claim 50, wherein the laser light source further comprises:

a fiber for conveying laser light from the semiconductor laser;

a solid state laser crystal for receiving laser light emitted from the fiber so as to generate a fundamental wave; and

an optical wavelength conversion element for generating a harmonic wave from the fundamental wave.

53. (Amended) A laser light source according to claim 50, wherein the semiconductor laser is a distributed feedback type semiconductor laser; and the laser light source further comprises a semiconductor laser amplifier for amplifying laser light from the distributed feedback type semiconductor laser.

54. (Amended) A laser light source according to claim 50, wherein the laser light source further comprises:

an optical wavelength conversion element in which an optical waveguide for guiding laser light from the semiconductor laser and periodic domain inverted structures are formed, wherein

a width and a thickness of the optical waveguide are each 40 µm or greater.

55. (Amended) A laser device, comprising:

at least one laser light source including a semiconductor laser;

a modulator for changing an intensity of each laser light; and

a deflector for changing a direction of each laser light,

wherein laser light emitted from the laser light source is split into two or more optical paths, and the

respective split laser light is separately modulated with modulators to which signals different from each other are input, and a screen is irradiated with the separately modulated respective laser light from two directions.

56. (Amended) A laser device according to claim 55, wherein the laser light source further comprises:

an optical wavelength conversion element for generating a harmonic wave; and

a single mode fiber for conveying laser light from the semiconductor laser to the optical wavelength conversion element.

57. (Amended) A laser light source according to claim 55, wherein the laser light source further comprises:

a fiber for conveying laser light from the semiconductor laser;

a solid state laser crystal for receiving laser light emitted from the fiber so as to generate a fundamental wave; and

an optical wavelength conversion element for generating a harmonic wave from the fundamental wave.

58. (Amended) A laser light source according to claim 55, wherein the semiconductor laser is a distributed feedback type semiconductor laser; and the laser light source further comprises a semiconductor laser amplifier for amplifying laser light from the distributed feedback type semiconductor laser.

59. (Amended) A laser light source according to claim 55, wherein the laser light source further comprises:

an optical wavelength conversion element in which an optical waveguide for guiding laser light from the semiconductor laser and periodic domain inverted structures are formed,

wherein a width and a thickness of the optical waveguide are each 40 μm or greater.

60. A laser device according to claim 55, wherein two optical paths are formed by two laser light sources, and the laser light sources respectively experience different modulations.

61. A laser device according to claim 55, wherein the two optical paths are switched with each other based on time.

62. (Canceled)

63. (Amended) A laser device, comprising:

at least one laser light source including a semiconductor laser;

a first optical system for setting laser light emitted from the laser light source into a parallel beam;

a liquid crystal cell for spatially modulating the parallel beam; and

a second optical system for irradiating a screen with light emitted from the liquid crystal cell,

wherein the laser light source further comprises:

an optical wavelength conversion element for generating a harmonic wave; and

a single mode fiber for conveying laser light from the semiconductor laser to the optical wavelength conversion element.

64. (Amended) A laser device, comprising:

at least one laser light source including a semiconductor laser;

a first optical system for setting laser light emitted from the laser light source into a parallel beam;

a liquid crystal cell for spatially modulating the parallel beam; and

a second optical system for irradiating a screen with light emitted from the liquid crystal cell,

wherein the laser light source further comprises:

a fiber for conveying laser light from the semiconductor laser;

a solid state laser crystal for receiving laser light emitted from the fiber so as to generate a fundamental wave; and

an optical wavelength conversion element for generating a harmonic wave from the fundamental wave.

65. (Amended) A laser device, comprising:

at least one laser light source including a semiconductor laser;

a first optical system for setting laser light emitted from the laser light source into a parallel beam;

a liquid crystal cell for spatially modulating the parallel beam; and

a second optical system for irradiating a screen with light emitted from the liquid crystal cell,

wherein the semiconductor laser is a distributed feedback type semiconductor laser; and

the laser light source further comprises a semiconductor laser amplifier for amplifying laser light from the distributed feedback type semiconductor laser.

66. (Amended) A laser device, comprising:

at least one laser light source including a semiconductor laser;

a first optical system for setting laser light emitted from the laser light source into a parallel beam;

a liquid crystal cell for spatially modulating the parallel beam; and

a second optical system for irradiating a screen with light emitted from the liquid crystal cell,

wherein the laser light source further comprises an optical wavelength conversion element in which an optical waveguide for guiding laser light from the semiconductor laser and periodic domain inverted structures are formed, and

a width and a thickness of the optical waveguide are each 40 μm or greater.

67. (Amended) A laser device according to claim 45, wherein the sub-semiconductor laser is an infrared semiconductor laser.

68. (Amended) A laser device according to claim 46, 47, 49, 51, 52 or 54, wherein laser light radiation is terminated by shifting a phase-matched wavelength of the optical wavelength conversion element.

69. (Amended) An optical disk apparatus, comprising:

an optical pickup incorporating therein an optical wavelength conversion element for converting a fundamental wave to a harmonic wave;

a laser light source, provided separately from the optical pickup, for generating laser light; and

an actuator for moving the optical pickup,

wherein the laser light radiated from the laser light source is incident upon the optical pickup via an optical fiber.

70. An optical disk apparatus according to claim 69, wherein the laser light source includes a semiconductor laser disposed outside the optical pickup.

71. An optical disk apparatus according to claim 70, wherein the laser light source further comprises a solid state laser crystal for generating a fundamental wave using laser light emitted from the semiconductor laser as pumped light.

72. An optical disk apparatus according to claim 71, wherein: the solid state laser crystal is disposed outside the optical pickup; and the fundamental wave generated by the solid state laser medium is incident upon the optical wavelength conversion element via the optical fiber.

73. An optical disk apparatus according to claim 71, wherein: the solid state laser crystal is disposed inside

the optical pickup; and the laser light emitted from the semiconductor laser is incident upon the solid state laser via the optical fiber.

74. A laser light source according to claim 30, wherein a harmonic wave is superimposed over the semiconductor laser during operation.

75. A laser light source according to claim 40, wherein a harmonic wave is superimposed over the semiconductor laser during operation.

76. (Added) A laser device, comprising:

a laser light source comprising: a semiconductor laser for radiating laser light; a solid state laser crystal for receiving laser light radiated from the semiconductor laser so as to generate a fundamental wave; and an optical wavelength conversion element for generating a harmonic wave based on the fundamental wave;

a modulator for modulating an output intensity of the harmonic wave; and

a deflector for changing a direction of the harmonic wave emitted from the laser light source,

wherein periodic domain inverted structures are formed in the optical wavelength conversion element, and

a wavelength of the fundamental wave incident on the optical wavelength conversion element is set to be constant.

77. (Added) A laser device, comprising:

three laser light sources generating red, green and blue laser light;

a modulator for changing an intensity of each laser light; and

a deflector for changing a direction of each laser light,

wherein at least one of the three laser light sources is formed of: a semiconductor laser; a solid state

laser crystal for receiving laser light radiated from the semiconductor laser so as to generate a fundamental wave; and an optical wavelength conversion element for generating a harmonic wave based on the fundamental wave,

periodic domain inverted structures are formed in the optical wavelength conversion element, and

a wavelength of the fundamental wave incident on the optical wavelength conversion element is set to be constant.

ARGUMENT

To: Commissioner of the Patent Office

1. Identification of International Application
   PCT/JP96/01472

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4. Date of Notification:
   March 18, 1997

5. Subject Matter of Argument

A. Applicant respectfully argues as follows to the opinion of the Examiner set forth in section V of the Written Opinion.

(1) The present invention recited in claim 1 (independent claim) has been judged as lacking novelty and an inventive step over Document 1 cited in the International Search Report.

However, Document 1 only discloses "performing an annealing process at a temperature sufficiently lower than the Curie temperature." Document 1 neither teaches or suggests, at all, "performing a low-temperature annealing at a low temperature (specifically, at 120°C or less as recited in claim 1)."

For example, Document 1 in paragraph 41 describes "an annealing process at a temperature sufficiently lower than the Curie temperature," and the specific annealing temperature is, for example, about 500°C in the case of $LiTaO_3$, as described in line 4 of the paragraph. Note that the value "100°C" described in paragraph 3 of the paragraph is merely the temperature difference between the Curie temperature and the annealing temperature. The actual annealing temperature in Document 1 is set to a relatively high temperature as described above.

Thus, Document 1 neither teaches nor suggests the low-temperature annealing of the present invention recited in claim 1.

Moreover, in the present invention, such a low-temperature annealing process provides significant effects such as stabilization of a proton stabilized layer and, further, formation of a stable optical element, whereas Document 1 neither teaches nor suggests such effects.

Therefore, taking the above points into consideration, Applicant submits that the present invention recited in claim 1 should be considered as involving novelty and an inventive step over Document 1.

(2) The present invention recited in claim 13 (independent claim) has been judged as lacking novelty and an inventive step over Document 2 cited in the International Search Report.

In response to this, Applicant has made an amendment to incorporate the limitation of claim 14 (dependent claim) into claim 13 in the Amendment filed together with this Argument. As a result, Applicant submits that amended claim 13 has novelty and an inventive step over Document 2.

(3) The present invention recited in claim 35 (independent claim) has been judged as lacking an inventive step over the combination of Document 3 and Document 8 cited in the International Search Report.

However, the present invention recited in claim 35 uses an ultraviolet laser light source configured to be capable of radiating a modulated ultraviolet laser light, i.e., an ultraviolet laser light source which itself has a modulation function. This feature of the present invention realizes effects such as reduction of size or reduction of cost. On the other hand, in the configuration described in Document 8 (see, for example, Figure 1), a laser beam (20) emitted from a laser light source (13) is modulated by an optical modulator (21) after being subjected to wavelength conversion. That is, the modulation function for laser light is realized by a modulator provided separately from the laser light source.

Even if those skilled in the art were to combine Document 3 and Document 8, there is no motivation in the documents prompting them to modify the fundamental arrangement of the configuration disclosed in Figure 1 of Document 8. Therefore, in a configuration obtained from such a combination, the modulation function is effectuated upon laser light after it is emitted from the laser light source, but there would never be provided the configuration of the present invention as recited in claim 35 which includes a laser light source having a modulation function on its own.

Therefore, Applicant submits that the present invention recited in claim 35 (independent claim) should be considered patentable over the combination of Document 3 and Document 8.

(4) The present invention recited in claim 30 or 40 (both independent claims) has been judged as lacking an inventive step over the combination of Document 3 and Document 9 cited in the International Search Report.

In response to this, in the Amendment filed together with this Argument, Applicant has made an amendment to distinctly specify that "the semiconductor laser (included in a light source) is wavelength-locked" in each of claims 30 and 40. Such a configuration provides an effect that the wavelength of light emitted from the semiconductor laser is kept at a substantially constant level even when there occurs a change in the environmental temperature, or the like, thereby stably realizing generation of a higher harmonic wave by the optical wavelength conversion element (having domain inverted structures) using light emitted from the semiconductor laser as a fundamental wave.

However, Document 9 neither teaches nor suggests, at all, the necessity of stabilizing the wavelength of the emitted light by the wavelength locking of the semiconductor laser

as described above. Thus, even if those skilled in the art were to combine Document 3 and Document 9, they can never obtain the configuration of the present invention as recited in claim 30 or 40.

Therefore, Applicant submits that the present invention recited in claim 30 or 40 (both independent claims) should be considered patentable over the combination of Document 3 and Document 9.

(5) In the Amendment filed together with this Argument, Applicant has newly added claims 76 and 77 (both independent claims). These new claims recite a configuration employing "a semiconductor laser and a solid state laser crystal for receiving laser light emitted from the semiconductor laser" instead of "a wavelength-locked semiconductor laser" as in the above-described configuration recited in claim 30 or 40. In this configuration, light emitted from the solid state laser crystal is incident upon the optical wavelength conversion element as a fundamental wave, and is subjected to wavelength conversion whereby a higher harmonic wave is generated. At this point, even if the wavelength of the light emitted from the semiconductor laser is changed for some reason, the wavelength of light emitted from the solid state laser crystal is uniquely set at an oscillation wavelength which is determined depending upon the crystal material. Therefore, the same effect as in the present invention recited in claim 30 or 40 can be realized.

Applicant submits that the present invention recited in claim 76 or 77 (both independent claims) should also be considered patentable over the combination of Document 3 and Document 9 for the same reason set forth above with respect to the present invention recited in claim 30 or 40 (both independent claims).

(6) The present invention recited in claim 45 (independent claim) has been judged as lacking an inventive step over the combination of Document 10 and Document 11 cited in the International Search Report.

However, in the configuration recited in claim 45, when a optical path of light emitted from a sub-semiconductor laser is blocked for some reason, the radiation of laser light from the laser light source is terminated. Thus, the function as a safety device during operation of the device is realized. Such a configuration is clearly different from the "configuration which is driven so as to oscillate only when light is detected" suggested by Document 11.

Thus, even if those skilled in the art were to combine Document 10 and Document 11, they can never obtain the configuration of the present invention as recited in claim 45. Therefore, Applicant submits that the present invention recited in claim 45 should be considered patentable over the combination of Document 10 and Document 11.

(7) The present invention recited in claim 55 (independent claim) has been judged as lacking an inventive step over Document 12 cited in the International Search Report.

In response to this, in the Amendment filed together with this Argument, Applicant has amended claim 55 so as to distinctly recite that "respective split laser light is separately modulated." That is, in the aforementioned configuration of the present invention, the respective split laser light is separately modulated with separate signals so as to irradiate a screen while being superimposed by different modulation signals.

On the other hand, the configuration of Document 12 merely splits light emitted from a modulator 2. In such a configuration as that of Document 12, unlike the configura-

tion of the present invention, laser light is split after being modulated, whereby the respective split laser light merely irradiates the screen while being superimposed by the same modulation signal.

Thus, even if those skilled in the art were to refer to Document 12, they can never obtain the configuration of the present invention as recited in claim 45. Therefore, Applicant submits that the present invention recited in claim 55 should be considered patentable over Document 12.

(8) The present invention recited in claim 69 (independent claim) has been judged as lacking an inventive step over Document 6 cited in the International Search Report.

In response to this, in the Amendment filed together with this Argument, Applicant has amended claim 69 so as to more distinctly recite the configuration of the present invention. Specifically, in the present invention recited in claim 69, an optical pickup and a laser light source are provided separately from each other, where only the optical wavelength conversion element is provided in the optical pickup. This increases the freedom in positioning the semiconductor laser. For example, it is possible to release heat generated by the semiconductor laser through the frame of the optical disk apparatus. In this case, it is possible to use a high output semiconductor laser.

On the other hand, Document 6 merely connects a light source section to a secondary harmonic wave generation section with an optical fiber. It is not apparent from this configuration to provide an optical pickup and a laser light source separately from each other.

Thus, even if those skilled in the art were to refer to Document 6, they can never obtain the configuration of the present invention as recited in claim 69. Therefore,

Applicant submits that the present invention recited in claim 69 should be considered patentable over Document 6.

B. Applicant respectfully argues as follows to the opinion of the Examiner set forth in section VIII of the Written Opinion with respect to claims 1 to 9.

(9) "Formation of a proton exchange layer" according to the present invention recited in claims 1 to 9 relates to a proton exchange process for forming an optical waveguide. In the Amendment filed together with this Argument, Applicant has amended the pertinent claims so as to distinctly recite this point.

A high-temperature annealing process is recited in claim 4. Note, however, that Applicant has amended claim 4 in the Amendment so as to have more distinct recitations.